Claims

1. A temperature sensing system configured for use with a variable reluctance sensor consisting of a electrical conductor winding carrying a magnetically induced alternating current voltage signal, the temperature sensing system comprising:

a set of electrical components operatively coupled in a Wheatstone bridge configuration with said electrical conductor winding, said set of electrical components including a plurality of resistors, and said Wheatstone bridge configuration operatively coupled to an electrical ground;

a constant voltage source operatively coupled to said Wheatstone bridge configuration;

a first capacitive filter circuit operatively coupled to a first node of said Wheatstone bridge configuration, said capacitive filter circuit configured to pass only the magnetically induced alternating current voltage signal from said electrical conductor winding; and

a second capacitive filter circuit coupled to said node comprising at least one resistor and one capacitor, said second capacitive filter circuit configured to pass only a temperature dependant DC voltage signal from said electrical conductor winding.

2. The temperature sensing system of Claim 1 further including a differentiator circuit operatively coupled to said second capacitive filter circuit and to a predetermined electrical potential, said differentiator circuit configured to output a temperature dependant DC voltage signal referenced to said predetermined electrical potential.

3. The temperature sensing system of Claim 1 wherein said predetermined electrical potential is said electrical ground.

4. The temperature sensing system of Claim 1 wherein at least one of said plurality of resistors is selected to provide bias adjustment of said DC voltage signal representative of said temperature, whereby said DC voltage signal has a predetermined value for a corresponding predetermined temperature.

5. The temperature sensing system of Claim 1 wherein said Wheatstone bridge configuration of said set of electrical components consists of five nodes coupled by seven branches.

6. The temperature sensing system of Claim 5 wherein

the electrical conductive winding comprises a first of said seven branches;

a capacitor is disposed on a second of said seven branches;

a first resistor of said plurality of resistors is disposed on a third of said seven branches;

a second resistor of said plurality of resistors is disposed on a fourth of said seven branches;

a third resistor of said plurality of resistors is disposed on a fifth of said seven branches;

a fourth resistor of said plurality of resistors is disposed on a sixth of said seven branches; and

a fifth resistor of said plurality of resistors is disposed on a seventh of said seven branches.

7. The temperature sensing system of Claim 5 wherein

said first, third, and sixth branches are coupled a first of said five nodes;

said fourth, fifth, and seventh branches are coupled at a second of said five nodes;

said second, sixth, and seventh branches are coupled at a third of said five nodes;

said third and fifth branches are coupled at a fourth of said five nodes; and

said first, second, and fourth branches are coupled at a fifth of said five nodes.

8. The temperature sensing system of Claim 7 wherein

said first capacitive filter circuit is operatively coupled to said first node;

said second capacitive filter circuit is operatively coupled between said second and third nodes;

said constant voltage source is operatively coupled to said fourth node; and

said electrical ground is operatively coupled to said fifth nodes.

9. The temperature sensing system of Claim 8 wherein said second capacitive circuit is configured to provide said DC voltage signal representative of a temperature of the electrical conductor winding in a ratio of :

$$\frac{R5}{(R4+R5)}$$

wherein

R4 is the electrical resistance of said fourth resistor; and

R5 is the electrical resistance of said fifth resistor.

10. The temperature sensing system of Claim 7 wherein said first, second, and third resistors are selected to provide bias adjustment of said DC voltage signal representative of said temperature, whereby said DC voltage signal has a predetermined value for a corresponding predetermined temperature.

11. The temperature sensing system of Claim 1 wherein said first capacitive filter circuit consists of a first capacitor coupled at an input side to said first node of said Wheatstone bridge configuration.

12. The temperature sensing system of Claim 11 wherein said first capacitive filter circuit further includes a voltage follower operatively coupled between an output side of said first capacitor and an input side of a second capacitor;

a resistor coupled between an output side of said second capacitor and an electrical ground; and

wherein said resistor is selected to have a nominal electrical resistance substantially corresponding to the electrical resistance of the

electrical conductive winding of the variable reluctance sensor at an ambient temperature.

13. A temperature sensing system configured for use with a variable reluctance sensor consisting of a electrical conductor winding carrying a magnetically induced alternating current voltage signal, the temperature sensing system comprising:

a set of electrical components operatively coupled in a Wheatstone bridge configuration with said electrical conductor winding, said set of electrical components including at least a plurality of resistors, said Wheatstone bridge configuration operatively coupled to an electrical ground;

a constant voltage source operatively coupled to said Wheatstone bridge configuration;

a capacitive filter circuit operatively coupled to a first node of said Wheatstone bridge configuration, said capacitive filter circuit configured to pass only the magnetically induced alternating current voltage signal from said electrical conductor winding; and

a comparator circuit operatively coupled to said capacitive filter circuit and to a predetermined electrical potential, said differentiator circuit configured to output a temperature dependant DC voltage signal referenced to said predetermined electrical potential.

14. The temperature sensing system of Claim 13 wherein at least one of said plurality of resistors is selected to provide bias adjustment of said DC voltage signal representative of said temperature, whereby said DC voltage signal has a predetermined value for a corresponding predetermined temperature.

15. The temperature sensing system of Claim 13 wherein said capacitive filter circuit consists of a first capacitor coupled at an input side to said first node of said Wheatstone bridge configuration.

16. The temperature sensing system of Claim 15 wherein said capacitive filter circuit further includes a voltage follower operatively

coupled between an output side of said first capacitor and an input side of a second capacitor;

a resistor coupled between an output side of said second capacitor and a capacitive connection to an electrical ground; and

wherein said resistor is selected to have a nominal electrical resistance substantially corresponding to the electrical resistance of the electrical conductive winding at an ambient temperature.

17. A method for utilizing an electrical conductive winding generating magnetically induced alternating current voltage signals in a variable reluctance speed sensor as a temperature sensor, comprising the steps of:

supplying a constant voltage to the electrical conductive winding through a voltage drop resistor, said constant voltage superimposing a direct current voltage signal with said magnetically induced alternating current voltage signal, said direct current voltage signal quasi-proportional to a temperature of the electrical conductive winding;

extracting, at a first output point, said temperature proportional direct current voltage signal from said superimposed direct current and alternating current voltage signal; and

extracting, at a second output point, said original alternating current voltage signal from said superimposed direct current and alternating current voltage signal

18. The method of Claim 17 further including comparing said extracted temperature proportional direct current voltage signal with a predetermined voltage signal.

19. The method of Claim 18 wherein said predetermined voltage signal is an electrical ground.

20. The method of Claim 18 wherein said predetermined voltage signal is representative of a temperature limit, and further including the step of signaling an alarm if said extracted temperature proportional direct current voltage signal represents a temperature which is at least equal to said temperature limit.

21. A temperature sensing system configured for use with a variable reluctance sensor having an electrical conductor winding carrying a magnetically induced alternating current voltage signal, the temperature sensing system comprising:

a drop resistor electrically coupled in series with said electrical conductor winding;

a constant voltage source electrically coupled in closed loop series with said drop resistor and said electrical conductor winding;

a capacitive filter circuit operatively coupled to a node point between said drop resistor and said electrical conductor winding, said capacitive filter circuit configured to output only the magnetically induced alternating current voltage signal from said electrical conductor winding; and

a second capacitive filter circuit coupled to said node comprising at least one resistor and one capacitor, said second capacitive filter circuit configured to output only a DC voltage signal from said electrical conductor winding, said DC voltage signal representative of a temperature at said electrical conductor winding.

22. The temperature sensing system of Claim 21 further including an electrically resistive circuit operatively coupled in parallel with said constant voltage source.

23. The temperature sensing system of Claim 22 wherein said electrically resistive circuit includes first and second resistors electrically coupled in series; and

wherein said first resistor, said second resistor, and said drop resistor are selected to obtain a DC voltage signal of a specific value for a specific temperature between said second capacitive filter circuit and a second node point between said first and second resistors.

24. The temperature sensing system of Claim 23 further including a third capacitive filter circuit coupled to between said second node and said constant voltage source, said third capacitive filter circuit comprising at least one resistor and one capacitor, said third capacitive

filter circuit configured to improve said DC voltage signal quality during a switch-on phase of said constant voltage source.